The dynamic impacts of MA on target firm's labor in Japan: tentative dynamic panel estimation by GMM

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The Dynamic Impacts of M&A on Target Firm's Labor in Japan*

— Tentative Dynamic Panel Estimation by GMM —

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Abstract

This paper provides a systematic empirical analysis of the effects of the M&A on target firm's employment in Japan. It may contribute to the Japanese literature by capturing the dynamic employment impacts of firm acquisition using latest micro data. Our main findings are: the immediate effects of firm acquisition on target firm's employment proved to be significantly negative presumably due to labor restructuring intended by the acquiring firm, while the negative effects do not appear to last as the subsequent dynamic impacts on target firm's employment.

Key words: M&A. firm acquisition, dynamic employment effects
JEL Classification Codes: D21, M51

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1. Introduction

The merger and acquisition (M&A) in firms' activities have shown the boom in recent years at the global level under the backgrounds of the progress of technological innovation and deregulation. Japan has been not an exception in the global boom, and experienced a rapid increase of the M&A activities since the later half of the 1990s. Although global credit shrinkage caused by US subprime loan turmoil and the subsequent deterioration of the real economy impacted the global M&A trends, Japanese M&A market still shows robust growth.

The impact of firm acquisition on the value of both the acquiring and the acquired firm has been the subject of a large and growing body of research literature. As for the effects on labor, there is a popular perception that the acquisition activity usually leads to, and indeed is often motivated by, the opportunity for substantial workforce reduction. This general interpretation was typically endorsed by an influential contribution of Shleifer and Summers (1988), which suggested that the control changes associated with acquisition activity offer an opportunity to firms to renege on implicit and explicit labor contracts, leading to a "breach of trust" with employees. On the other hand, acquisitions may occur because the firm believes it can manage the firm more efficiently than current management. The better management might lead to more and better jobs, particularly if new management has better access to capital markets for expanding the operation. While there exists an abundance of anecdote and general comment on the topic, there is very little systematic empirical evidence on the employment effects of firm acquisition and almost none in Japan. Furthermore, the limited existing literature – see Section 2 below – shows a variety of sampling procedures and methodologies and is also ambiguous in its findings.

This paper provides a systematic empirical analysis of the effects of the M&A on target firm's employment in Japan. It may contribute to the Japanese literature by capturing the dynamic employment impacts of firm acquisition using latest micro data. The paper proceeds as follows. Section 2 describes the recent trend of the M&A in Japan, Section 3 summarizes the empirical literature and makes clear our position, Section 4 represents the empirical framework and estimation results, and the last section concludes.

2. Recent Trend of M&A in Japan

Japan has experienced so-called M&A boom since the later half of the 1990s. Figure

1 indicates remarkable increase in the number of M&A cases from around 500 cases in the mid of the 1990s to more than 2,000 cases in the 2000s, although showing its slight decline after 2007 due to the global credit shrinkage caused by the U.S. subprime loan turmoil (see Figure 1).

Looking at their composition by the types of M&A in Table 1, we can find the following characteristics. First, the number of M&A case in which a Japanese firm acquired a foreign firm ("in-out" M&A) represents rapid growth in the later half of 1980s and rather stable trend thereafter. The share of "in-out" M&A also climbs to about 60 percent until 1990 and then continues to decline toward around 15 percent in 2008. The background of the "in-out" M&A boom in the 1980s is nothing more than the robust economy in that period, which had made Japanese companies go ahead into foreign markets, with the Sony Corporation's acquisitions of CBS Records Inc. and Columbia Pictures Entertainment a typical example.

Second, the main element to create the 1990s-2000s M&A boom is the "in-in" M&A case, in which a Japanese company acquired another Japanese one. Its number as well as its share has grown up from around 200-300 cases (the share: around 50 percent) in the mid of the 1990s toward more than 2,000 cases (the share: about 80 percent) in the mid of the 2000s. The "in-in" M&A boom appears to come mostly from the necessity of industry consolidation amid intensifying international competition. In the steel industry, for example, two of Japan's major steelmakers – Kawasaki Steel Corp. and NKK Corp. – were merged into JFE Holdings, inc. in 2002 in response to the fierce competition with their South Korean and Chinese counterparts. The individual companies' efforts to reorganize group companies with the introduction of new accounting rules on a group-wide basis, may contribute to the "in-in" M&A boom.

Lastly, another element for the 1990s-2000s M&A boom is the "out-in" M&A case, in which a Japanese company was acquired by a foreign one. The number increased from around 50-60 cases in the mid of the 1990s toward about 200 cases in the mid of the 2000s. The "out-in" M&A can often be seen as a case for strengthening the domestic presence of foreign companies, with the City Group's acquisition of the Nikkou Cordial group in 2007 a typical example. The activated role of foreign investment funds seems to have contributed to the increasing "out-in" M&A.

For investigating the factors behind the 1990s-2000s M&A boom, Arikawa and Miyajima (2007) picked up two different hypotheses and examined which hypothesis is applicable to Japanese M&A boom. The first hypothesis, which is often referred to as a neoclassical explanation, focuses on industry-level shocks to growth opportunities and profitability as a factor of M&A. Mitchell and Mulherin (1996) and Harford (2005),

recognizing that M&A activities concentrate in specific industries, argued that the occurrence of shocks to growth opportunities and/or profitability that require a large-scale intra- or inter-industry redistribution of resources leads to a boost in the number of M&A as an efficient means of reallocating resources. The other hypothesis is called "market-driven," based on the assumption of stock market mispricing. Shleifer and Vishny (2003) theoretically showed that managers of bidding companies, when they have the information that the market valuation of their companies is higher than their fundamental value, have an incentive to seek profits by making acquisitions in stock-for-stock deals; and that myopic managers of target companies have an incentive to sell their companies, in disregard of the long-term profit prospects, by agreeing to favorable terms offered by bidders.

Arikawa and Miyajima (2007) examined the hypotheses above by using industry-by-industry data as well as individual companies' data. Their findings supported not the "market-driven" hypothesis but the neoclassical explanation; the 1990s-2000s M&A boom in Japan comes from some sort of shock that impacted the growth opportunities and profitability of the industry.[1] Miyajima et al. (2007) also stated that the recent, rapid increase in M&A in Japan has been driven by economic shocks - both positive and negative - such as technological innovation and sharp falls in demand, and that the increasing M&A have facilitated resource allocation in terms of downsizing less profitable divisions and expanding high-growth divisions, thereby contributing to the improvement of organizational efficiency through the transfer of management resources and know-how. Those findings that the M&A in Japan has been driven by real shock tempt us to recognize the significance in examining the labor impact of the M&A in later section.

3. Previous Studies and Our Position

Evidence on the overall employment impact of the M&A has been very limited. In addition, the limited evidence has been based on a variety of sampling procedures and methodologies, and has reported mixed findings. We first pick up several representative studies in the United States of America (USA), European countries including the United Kingdom (UK), and Japan.

As for the literature in the USA, Brown and Medoff (1988) examined the effects of

[1] As well as testing the two hypotheses, they described the impacts of legal reform on promoting M&A: the lifting of the ban on holding companies (1997), the introduction of stock transfer system (1999), the tax incentive measures for revitalizing industry (1999), etc.

firm's control changes with a large sample of firms in the state of Michigan. Their results suggested that the employment consequences depend upon the type of control change; Asset disposals were followed by a decrease in employment, while true mergers produced a small increase. The generality of the results is open to question, because their data set is numerically dominated by very small firms and excludes interstate acquisitions, where large-scale takeovers predominate. McGuckin et al. (1995), in a study using US plant-level data, reported that employment in acquired plants increased relative to that in non-acquiring firms, but suggested this was accompanied by improved operating efficiency, particularly in the smaller plants in their sample. However, when the authors used firm-level data they found no significant employment consequences. In a more recent study, McGuckin and Nguyen (2001) argued that ownership changes are not a primary vehicle for cuts in employment and wages, or closing plants, and instead, ownership changes are associated with increases in employment for the entire US manufacturing sector.

Concerning the literature in European countries, Conyon et al. (2002) provided a systematic empirical analysis of the effects of take-over and merger activity on firm employment in the UK using a specially constructed database. They indicated that significant rationalizations in the use of labor occur as firms reduce joint output and increase efficiency post-merger, and that these effects are particularly pronounced in the case of related and especially hostile mergers. On the other hand, Amess and Wright (2007), using a unique hand-collected dataset, examined the effects of leveraged buyouts on wages and employment in the UK. They found that all leveraged buyouts taken together have an insignificant effect on employment growth but have significantly lower wage growth than non leveraged buyouts. Lehto and Böckerman (2008) examined the employment effects of M&A by using establishment-level data from Finland, and found that the cross-border M&A lead to downsizing in manufacturing employment as well as the changes in ownership associated with domestic M&A also causing employment losses.

As long as we see the previous works above, the evidence of labor losses by M&A appear more often in European countries than in the USA. Here comes Gugler and Yurtoglu (2004), which compared the effect of merger and acquisition on employment in Europe and the USA. While they did not find adverse effects of mergers on labor demand in the USA, they did find negative effects in Europe of the order of minus 10% compared to pre-merger levels. They attributed this significant difference to more rigid labor markets in Europe than in the USA.

Evidence on the employment impact of merger and acquisition has been extremely

limited in Japanese literature. To our knowledge, the only systematic empirical study is found in Kubo and Saito (2007). They focused their analyses on the merger's impact on employment, and examined the 114 cases of mergers during the period from 1990 to 2003 among companies whose stock is listed on the Tokyo Stock Exchange. They found that during the post- 1999 period the mergers brought about the effect on employees' reduction by ten percent on average, and that the effect varied depending on the purpose of mergers as well as pre-merger firm's performance; the mergers within the related industry, and the ones intended for firm relief produced more curtailment of employees than the average.

This paper tries to extend the fore-mentioned research literature, mainly of Kubo and Saito (2007), in the following directions. First, we focus our analysis on the employment impacts of the *firm acquisition*, whereas Kubo and Saito (2007) concentrate only on the *merger's* effects on employment. In fact, the cumulative number of the acquisition case is more than that of the merger case during the 2000s. Second, we capture the *dynamic* employment effects of firm acquisition through using latest micro data, while the earlier study estimated only the *immediate* employment effects.

4. Empirical Studies

We now turn to empirical studies of the effects of firm acquisitions on acquired firms' employment in Japan. Before stepping into the analyses, we first clarify the used data and methodology, and then exhibit the estimation results and their interpretations.

4.1 Methodology

An ordinary dynamic labor demand function, assuming that output constrained firms face continuous quadratic adjustment costs and use a Cobb–Douglas technology, takes the following form of equation (see Bresson et al. (1996) or Nickell (1984) for a full exposition):

$$l_{it} = \alpha\, l_{it-1} + \beta_1 q_{it} + \beta_2\, q_{it-1} + \gamma_1 (w/c)_{it} + \gamma_2 (w/c)_{it-1} + \delta_t D_t + f_i + \varepsilon_{it} \qquad (1)$$

where l_{it}, q_{it} and $(w/c)_{it}$ denote the logarithms of employment, real output and real wages relative to user cost of capital of firm i in period t. Dt are a set of time dummies to account for technical progress and business cycle effects, and f_i are firm-specific fixed effects, which subtract firm-specific means from all the variables removing all time

invariant determinants of labor demand growth. ε_{it} is an equation disturbance term.

Our method of estimating the impact of M&A on employment is by the introduction of dummy variables. Since the sufficient data for output, wages and user cost of capital are not available as explained later, the variables of real output and relative input prices are omitted from our estimation. Thus, the estimated equation is composed of employment, the dummy related with M&A, time dummies and firm-specific dummies. It has to be notified that in the following estimations we focus only on the employment effects of not acquirer but *target* firm.

For the purpose of capturing the *dynamic* employment effects of M&A, we specify the estimated equations in the following two ways. The first one is to simply slide the M&A dummy. To put it concretely, we estimate the following equations step by step.

$$
\begin{aligned}
l_{it} &= \alpha_0 l_{it-1} + \lambda_{0a} DA_{it} + \lambda_{0b} DI_{it} + \lambda_{0c} DE_{it} + \lambda_{0d} DM_{it} + \delta_t D_t + f_i + \varepsilon_{it} \\
l_{it} &= \alpha_0 l_{it-1} + \lambda_{0a} DA_{it} + \lambda_{0b} DI_{it} + \lambda_{0c} DE_{it} + \lambda_{0d} DM_{it} \\
&\quad + \lambda_{1a} DA_{it-1} + \lambda_{1b} DI_{it-1} + \lambda_{1c} DE_{it-1} + \lambda_{1d} DM_{it-1} + \delta_t D_t + f_i + \varepsilon_{it} \\
l_{it} &= \alpha_0 l_{it-1} + \lambda_{0a} DA_{it} + \lambda_{0b} DI_{it} + \lambda_{0c} DE_{it} + \lambda_{0d} DM_{it} \\
&\quad + \lambda_{1a} DA_{it-1} + \lambda_{1b} DI_{it-1} + \lambda_{1c} DE_{it-1} + \lambda_{1d} DM_{it-1} \\
&\quad + \lambda_{2a} DA_{it-2} + \lambda_{2b} DI_{it-2} + \lambda_{2c} DE_{it-2} + \lambda_{2d} DM_{it-2} + \delta_t D_t + f_i + \varepsilon_{it} \\
&\cdots
\end{aligned}
\qquad (2)
$$

where *DA*, *DI*, *DE* and *DM* are the M&A dummy: "firm acquisition", "capital participation", "capital increase", and "merge" respectively.[2] For instance, if the firm i is acquired by another firm in the period of t, $DA_i = 1$ after the period of t continuously. The key statistics of interest, λ_0, measure the *immediate* impact of M&A on labor demand in percentage terms relative to the non-M&A labor trends, and λ_1, λ_2,$\cdots$ represent the *dynamic* impact on the post-M&A employment.

Another way for capturing the *dynamic* employment effects of M&A is to insert the post-M&A trend dummy into the equation. Specifically, we estimate the following equation.

$$
\begin{aligned}
l_{it} &= \alpha\, l_{it-1} + \lambda_a\, DA_{it} + \lambda_b\, DI_{it} + \lambda_c\, DE_{it} + \lambda_d\, DM_{it} \\
&\quad + \lambda'_a\, TDA_{it} + \lambda'_b\, TDI_{it} + \lambda'_c\, TDE_{it} + \lambda'_d\, TDM_{it} + \delta_t D_t + f_i + \varepsilon_{it}
\end{aligned}
\qquad (3)
$$

[2] The definition of each case is as follows; "firm acquisition" is the case where more than 50 percent of the target firm's equity is acquired by another firm, "capital increase" is the case in which acquired equity is increased but up to less than 50 percent, "capital participation" is the case where the target firm's equity is acquired newly but up to less than 50 percent, and "merge" is the case in which the firm is merged.

where *TDA*, *TDI*, *TDE* and *TDM* are the post-M&A trend dummy respectively. In this equation, if the firm i is acquired by another firm in the period of t, for instance, $DA_i = 1$ after the period of t continuously, and TDA_i denotes 1,2,3,$\cdots$ after the period of t+1. The *immediate* impact of M&A on target firm's employment is indicated by λ, while the *dynamic* impact on the post-M&A employment is shown by λ'.

We call the former way of estimation as the "estimation without M&A trend dummy" and the latter way as the "estimation with M&A trend dummy". The former estimation can reveal the employment effect at each step of estimation, thereby for instance enabling us to see the turning point of employment effect during the post-M&A dynamic process, although sample data varies by each step of estimation. The latter estimation using M&A trend dummy can produce consistent outputs of employment impacts within the same sample data, while the pattern of time trend should be predetermined for estimating the post-M&A dynamic employment effect. In this study, we assume linearly and unlimitedly increasing pattern of time trend dummy during the post-M&A period. Through these two kinds of methods, both of which have merit and demerit in estimation, we can examine the dynamic effects as well as immediate effects of M&A on target firm's employment. Our hypothesis is that immediate effects might be negative due to the workforce restructuring and downsizing planned by M&A, whereas the dynamic effect may be positive as a result of enhancement of management efficiency during the post-M&A long-term period.

Another focus of our analysis is concerned with the estimation techniques. Equation (2) and (3) contain a lagged dependent variable and the OLS estimate might be inconsistent in the presence of unobserved firm-specific effects. Therefore, we estimate it not only by the OLS estimator but also by a system of GMM estimator developed by Arellano and Bond (1991). The GMM estimator eliminates firm effects by first-differencing as well as controls for possible endogeneity of explanatory variables. We use endogenous variables lagged two periods as dynamic panel instrument, conduct two step GMM iterations with updating weights once, and adopt White period as GMM weighting matrix. We present tests for autocorrelations and the Sargan test of over-identifying restrictions in the table that follow.

4.2 Database

The database used in this study is constructed from two sources so as to be as comprehensive as possible. The primary source of information relating to M&A comes from the MARR M&A Database presented by the RECOF. The database allowed the

identification of "firm acquisition", "capital participation", "capital increase", and "merge" of target firms as the cases of M&A (see the footnote of No.2 about their definition). The economic data for firm's employment[3] are collected by the NIKKEI NEEDS on-line database service. The firms are limited to the ones whose stock is listed on the Stock Exchange in Japan. The data for outputs and wages can not be used since their series have a lot of vacant data.

We combine the data from two sources above and construct panel data with 2,648 sample firms for the period from 1999 to 2007. Among the whole sample data, there are 124 cases of "firm acquisition", 445 of "capital participation", 299 of "capital increase", and 80 of "merge". The cases could not be divided into "out-in" and "in-in" because the number of "out-in" case is extremely rare during the sample period.

4.3 Estimation Results and Interpretations

Table 2 and Table 3 represent the results of estimation without trend dummy by the ordinary OLS estimator and the ones by the GMM estimator, respectively. The OLS estimation adopts fixed effects following the result of the Hausman test that rejects the null hypothesis of random effects. In the GMM estimation, the equation is estimated until the period of t-4, since the constraint of the data availability. The Sargan tests do not suggest rejection of the instrumental validity at conventional levels for either specification estimated. Since there is evidence of second order serial correlation in the residuals except Equation (1), there should be a room for model specification to be improved.

The OLS and GMM estimations (except Equation (3) and (4) in GMM) indicate that the inclusion of the lagged dependent variable of employment is positively discernable, thus imply inertia in firm employment and justify forming the dynamic panel model. The coefficient of the dummy variable of "firm acquisition" is significantly negative in the period of t in Equation (1), (2) and (7) of the OLS and in Equation (1) of the GMM. In the period before t-1, the coefficient turns to be insignificant or even significantly positive in Equation (1) to (6) of the OLS. The dummy variable of "capital participation" has significantly positive coefficient in the period of t in Equation (0) to (6) of the OLS. The "capital increase" dummy has significantly negative coefficient in the period of t in Equation (0), (1) and (5) of the OLS. The "merge" dummy has significantly positive coefficient in the period of t in all of Equations of the OLS and has significantly negative one in the period of t-1 in Equation (1) to (6).

[3] The firm's employment here does not include the part-time workers.

Table 4 reports the outcomes of estimation with trend dummy by estimators of OLS and GMM. The OLS estimator adopts fixed effect suggested by the Hausman test. The GMM keeps the instrumental validity as the Sargan test suggested, but can not reject serial correlation in the residuals. Both estimators support the inclusion of the lagged dependent variable of employment and justify the dynamic panel model. The coefficients supported commonly by both estimators are only the negative one of dummy variable with "firm acquisition" and the negative one of trend dummy variable with "merge". The positive coefficient of trend dummy with "firm acquisition", dummy with "capital participation" and "merge", and the negative one of dummy with "capital increase", are identified only by the OLS.

We summarize and interpret the estimation results above as follows. First, the negative immediate effect of firm acquisition on target firm's employment, supported by the GMM estimation as well as the OLS estimation, may imply rationalization in the use of labor i.e. labor restructuring intended by the acquiring firm. This result is in line with the previous literature on labor effects of M&A in European countries. Second, negative effect of firm acquisition on target firm's employment proved not to last in the subsequent dynamic process. The OLS estimator reported even significantly positive dynamic impacts on target firm's employment. It might reflect the change in the firm's management from its rationalization stage toward aggressive strategy during the post-acquisition dynamic process. The GMM could not verify any significant effects as dynamic process, however, possibly due to the lack of data availability for the GMM estimations. Third, the positive immediate effect of "capital participation" on target firm's labor, identified only by the OLS estimations, might imply an aggressive strategy for acquired firm to expand the business through strengthening its alliance with the acquirer. Fourth, the negative immediate effect of "capital increase", shown by the OLS estimation, might reflect the capital increase intended for firm relief. Finally, the negative dynamic effect of the "merge" identified by the OLS and GMM estimations with trend dummy may mirror the process of rationalization in the use of labor during the post-merge period.

5. Concluding remarks

This paper provides a systematic empirical analysis of the effects of the M&A on target firm's employment in Japan. It may contribute to the Japanese literature by capturing the *dynamic* employment impacts of firm acquisition using latest micro data. Our main findings are: i) the immediate effects of firm acquisition on target firm's

employment proved to be significantly negative presumably due to labor restructuring intended by the acquiring firm, while the negative effects do not appear to last as the subsequent dynamic impacts, ii) the positive labor effects of capital participation might imply an aggressive strategy for acquired firm to expand the business through strengthening its alliance with the acquirer.

This study is an initial step for a systematic empirical analysis of the employment effects of M&A. There seem to be several remaining issues to be addressed further. First, this study could not estimate the labor demand function in the complete form due to the lack of data availability. Thus, the other data source should be utilized to provide such necessary data as firm' output and wage. Second, the lack of sample data also made it difficult to investigate the differences in the impacts on target firm's employment between the case of a cross-border acquisition called "out-in acquisition", and a domestic acquisition called "in-in acquisition". One of the ways to expand the sample firms is to collect the information of not only listed firms but also unlisted firms on the Tokyo Stock Exchange. Third, the GMM estimation in this study has the problem in terms of the existence of serial correlation in the residuals. There should be much room for model specification to be improved by adding the necessary variables to the labor demand equation.

Figure 1 M&A Developments in Number

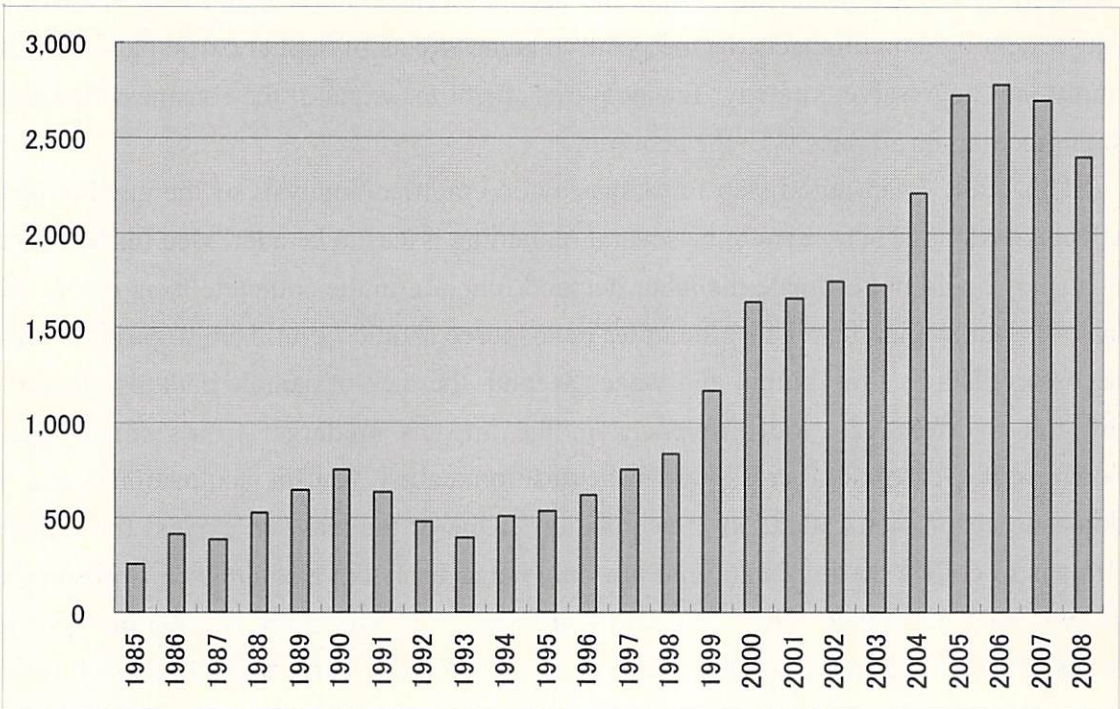

Table 1 M&A Developments in Number Classified into Market Entry Style

	IN-IN		IN-OUT		OUT-IN		Total
	Number	Portion %	Number	Portion %	Number	Portion %	Number
1985	161	61.9	78	30.0	21	8.1	260
1986	223	53.3	181	43.3	14	3.3	418
1987	206	53.9	158	41.4	18	4.7	382
1988	218	41.7	291	55.6	14	2.7	523
1989	245	38.0	388	60.2	12	1.9	645
1990	268	35.5	463	61.4	23	3.1	754
1991	309	48.4	301	47.2	28	4.4	638
1992	253	52.4	186	38.5	44	9.1	483
1993	234	58.9	120	30.2	43	10.8	397
1994	249	49.3	196	38.8	60	11.9	505
1995	255	48.0	222	41.8	54	10.2	531
1996	320	51.5	239	38.5	62	10.0	621
1997	453	60.2	224	29.7	76	10.1	753
1998	488	58.5	236	28.3	110	13.2	834
1999	721	61.7	266	22.8	182	15.6	1,169
2000	1,066	65.2	368	22.5	201	12.3	1,635
2001	1,190	72.0	289	17.5	174	10.5	1,653
2002	1,352	77.2	264	15.1	136	7.8	1,752
2003	1,352	78.2	213	12.3	163	9.4	1,728
2004	1,680	76.0	320	14.5	211	9.5	2,211
2005	2,129	78.1	411	15.1	185	6.8	2,725
2006	2,174	78.3	421	15.2	180	6.5	2,775
2007	2,020	74.9	367	13.6	309	11.5	2,696
2008	1,824	76.0	377	15.7	198	8.3	2,399

Note) M&A inside the same group is excluded.
Source) MARR M&A Database presented by the RECOF.

Table 2 Estimation without M&A Trend Dummy (OLS: Fixed Effect Estimate)

ln(Emp.)t	(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
constant	2.059 ***	2.037 ***	2.031 ***	2.341 ***	2.614 ***	3.352 ***	4.349 ***	5.924 ***
ln(Emp.)t-1	0.697 ***	0.700 ***	0.701 ***	0.655 ***	0.615 ***	0.507 ***	0.361 ***	0.131 ***
DAt	-0.022	-0.049 ***	-0.033 *	-0.029	-0.012	-0.007	-0.013	-0.063 *
DAt-1		0.048 **	0.044 *	0.047 *	0.039	0.041	0.062 **	-0.017
DAt-2			0.010	-0.026	-0.013	-0.024	-0.029	-0.004
DAt-3				0.053 *	0.010	-0.011	0.019	0.032
DAt-4					0.068 *	-0.011	-0.045	0.009
DAt-5						0.101 **	0.141 ***	-0.015
DAt-6							0.112 *	0.028
DAt-7								-0.044
DIt	0.026 ***	0.025 **	0.024 **	0.034 ***	0.035 ***	0.049 ***	0.032 **	0.005
DIt-1		0.001	-0.002	-0.015	-0.017	-0.029 **	-0.009	-0.003
DIt-2			0.005	0.010	-0.003	-0.004	-0.024	-0.017
DIt-3				0.001	-0.002	-0.007	-0.019	-0.101 ***
DIt-4					-0.000	-0.049 **	-0.076 ***	-0.076 ***
DIt-5						0.044 *	0.032	0.028
DIt-6							0.068 **	0.072
DIt-7								0.015
DEt	-0.020 **	-0.026 **	-0.018	-0.017	-0.018	-0.031 **	-0.026	-0.007
DEt-1		0.008	-0.004	-0.002	-0.008	-0.003	-0.013	0.007
DEt-2			0.021	0.010	0.016	0.010	0.006	0.002
DEt-3				0.014	0.012	0.010	0.008	0.029
DEt-4					-0.041 *	-0.017	-0.015	-0.019
DEt-5						-0.024	-0.036	-0.006
DEt-6							-0.017	-0.035
DEt-7								0.028
DMt	0.195 ***	0.369 ***	0.359 ***	0.354 ***	0.330 ***	0.291 ***	0.339 ***	0.252 ***
DMt-1		-0.283 ***	-0.284 ***	-0.252 ***	-0.255 ***	-0.183 ***	-0.125 ***	-0.055
DMt-2			0.009	-0.015	-0.012	-0.005	0.008	-0.018
DMt-3				0.011	0.000	0.037	0.037	-0.019
DMt-4					0.003	-0.021	0.033	0.053
DMt-5						0.007	0.011	-0.051
DMt-6							-0.004	-0.018
DMt-7								0.021
Period D	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hausman t.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of obs.	19,560	19,560	17,293	14,944	12,518	10,052	7,566	5,050

(Notes)

i) ***, **, and * indicate rejection at the 1 percent, 5 percent, and 10 percent significance levels.□

ii) "Hausman t." denotes the p-value of the null hypothesis of random effect estimation.

Table 3 Estimation without M&A Trend Dummy (GMM Estimate)

ln(Emp.)t	(0)	(1)	(2)	(3)	(4)
ln(Emp.)t-1	0.824 ***	0.777 ***	0.701 ***	0.467	0.630
DAt	-0.981	-1.354 *	-1.251	-1.845	1.554
DAt-1		0.748	0.758	2.707	-8.580
DAt-2			0.202	0.893	2.236
DAt-3				4.382	7.110
DAt-4					23.203
DIt	-0.213	-0.186	-0.190	-0.929	-1.375
DIt-1		0.030	0.217	1.063	2.609
DIt-2			-0.238	1.130	3.473
DIt-3				-3.115	-5.388
DIt-4					-4.063
DEt	-0.187	-0.451	-0.561	-3.116	-0.902
DEt-1		-0.205	-0.375	-0.120	0.141
DEt-2			0.427	-1.716	-7.384
DEt-3				0.744	6.824
DEt-4					-2.332
DMt	0.815	0.324	-2.467	-4.729	6.544
DMt-1		-0.608	-1.092	-3.619	-1.436
DMt-2			0.388	0.241	1.784
DMt-3				-0.140	-1.595
DMt-4					4.499
Period D	Yes	Yes	Yes	Yes	Yes
Sargan test	0.41	0.56	0.83	0.99	1.00
AR(1)	0.00	0.00	0.00	0.14	0.00
AR(2)	0.03	0.24	0.00	0.00	0.00
No. of obs.	16,978	16,978	14,722	12,376	9,956

(Notes)
i) ***, **, and * indicate rejection at the 1 percent, 5 percent, and 10 percent significant levels.
ii) "Sargan test" denotes the p-value of a Sargan-Hansen test of overidentifying restrictions.
iii) AR(k) is the p-value of a test that the average autocovariance in residuals of order k is zero.
iv) The instruments include lagged levels of the dependent variables dated t-2.

Table 4 Estimation with M&A Trend Dummy

	OLS	GMM
	ln(Emp.)t	ln(Emp.)t
constant	2.056 ***	
	(72.32)	
ln(Emp.)t-1	0.697 ***	0.662 ***
	(164.07)	(6.79)
DA	-0.046 ***	-2.712 **
	(-2.99)	(-2.25)
TDA	0.021 ***	0.020
	(3.34)	(0.06)
DI	0.021 **	-0.540
	(2.41)	(-1.17)
TDI	0.003	-0.119
	(1.10)	(-0.73)
DE	-0.027 ***	-0.543
	(-2.79)	(-0.77)
TDE	0.004	-0.185
	(1.12)	(-0.68)
DM	0.225 ***	-0.929
	(11.45)	(-0.43)
TDM	-0.024 ***	-0.713 *
	(-5.60)	(-1.66)
Period D	Yes	Yes
Hausman test	0.00	
Sargan test		0.84
AR(1)		0.05
AR(2)		0.00
No. of obs.	19,560	11,912

(Notes)

i) The t-value are in parentheses. ***, **, and * indicate rejection at the 1 percent, 5 percent, and 10□ percent significance levels.

ii) "Hausman t." denotes the p-value of the null hypothesis of random effect estimation.

iii) "Sargan test" denotes the p-value of a Sargan-Hansen test of overidentifying restrictions.

iv) AR(k) is the p-value of a test that the average autocovariance in residuals of order k is zero.

v) The instruments include lagged levels of the dependent variables dated t-2.

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